Trus Joist™ Weyerhaeuser

LIMIT STATES DESIGN 2010 NBCC

#TJ-8500 | SPECIFIER'S GUIDE

TRUS JOIST® RIM BOARD GUIDE FOR CANADA

Featuring TJ® Rim Board and TimberStrand® LSL

- Multiple thicknesses, grades, and products to cover all your rim board needs
- 1¼" Thickness matches lateral load capacity of 2x nominal sawn lumber in diaphragms
- Limited product warranty

The products in this guide are readily available through our nationwide network of distributors and dealers. For more information on other applications or other Trus Joist® products, contact your Weyerhaeuser representative.

TABLE OF CONTENTS

SUSTAINABLE FORESTRY INITIATIVE
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Benefits of Trus Joist® Rim Board

- Longer lengths for faster installation and fewer joints
- Depths are sized to match TJI® joists—less cutting and material waste when used together
- High vertical load transfer capacity

For years, little attention was paid to the importance of lateral forces in buildings covered by Part 9 of the Building Code. However, recent earthquake and hurricane disasters have demonstrated the importance of proper lateral load transfer. Engineering analysis confirms that rim board is essential in a home's ability to resist the lateral loads generated by high winds and earthquakes.

Trus Joist® rim board products offer vertical load support and provide the nailing surface necessary to adequately transfer wind and seismic loads. Manufactured by Weyerhaeuser according to strict quality assurance requirements, they provide strength, stiffness, and durability. We're so confident about the performance of all our rim board that it comes with a limited lifetime product warranty. When used with TJI® joists, it offers the ultimate high performance floor.

Available Sizes

Rim Material	Depth							
	9½"	11⅞"	14"	16"	18"	20"	22"	24"
1⅛" TJ® Rim Board	•	•	•	•				
1¼" 1.3E TimberStrand® LSL	•	•	•	•	•	•	•	•
1½" 1.3E TimberStrand® LSL	•	•	•	•	•	•	•	•
1¾" 1.55E TimberStrand® LSL	•	•	•	•	•	•	•	•
3½" 1.55E TimberStrand® LSL	•	•	•	•	•	•	•	•

Some sizes may not be available in your region.

Approximate Material Weights (PLF)

Rim Material	Depth							
	9½"	11⅞"	14"	16"	18"	20"	22"	24"
1⅛" TJ® Rim Board	2.9	3.6	4.3	4.9				
1¼" 1.3E TimberStrand® LSL	3.5	4.3	5.1	5.8	6.6	7.3	8.0	8.8
1½" 1.3E TimberStrand® LSL	4.2	5.2	6.1	7.0	7.9	8.8	9.6	10.5
1¾" 1.55E TimberStrand® LSL	5.2	6.5	7.7	8.8	9.8	10.9	12.0	13.1
3½" 1.55E TimberStrand® LSL	10.4	13.0	15.3	17.5	19.7	21.9	24.1	26.3

PRODUCT STORAGE

Protect product from sun and water

CAUTION:
Wrap is slippery when wet or icy

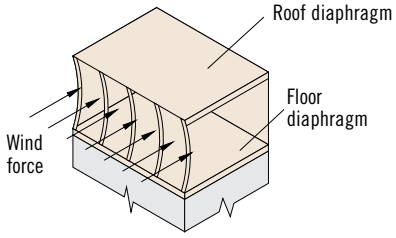
Align 2x3 (or larger) stickers directly over support blocks

Use 6x6 (or larger) support blocks at 10' on-centre to keep bundles out of mud and water

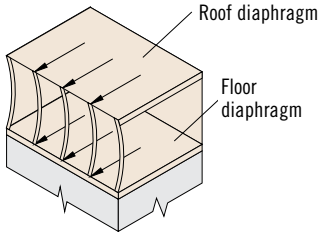
LATERAL LOAD CAPACITY AND 1¼" TIMBERSTRAND® LSL RIM BOARD

Why is lateral load capacity of rim boards important?

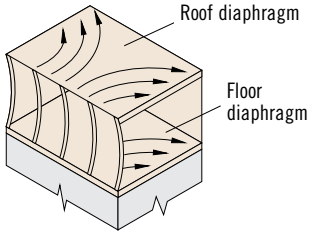
Lateral loading on structures is typically from wind or seismic forces, and rim board is an important structural link for resisting those lateral loads. To further explain lateral loads, let's look at a typical home and how the wind loads travel through the building:



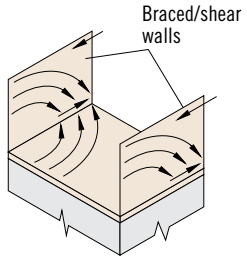
Wind force on a wall is resisted by wall sheathing and framing.



Wall is supported at top by roof diaphragm and at bottom by floor diaphragm.



Load in roof and floor diaphragms is transferred to side walls (or braced/shear walls) by rim board, rim joist, or blocking. Connections are essential to transfer load.

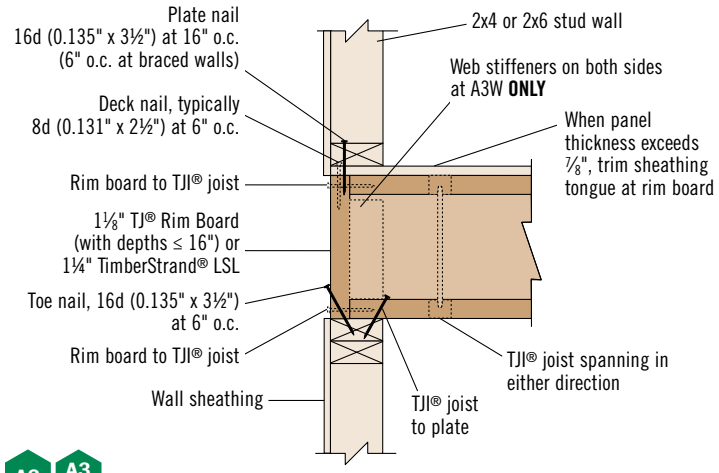


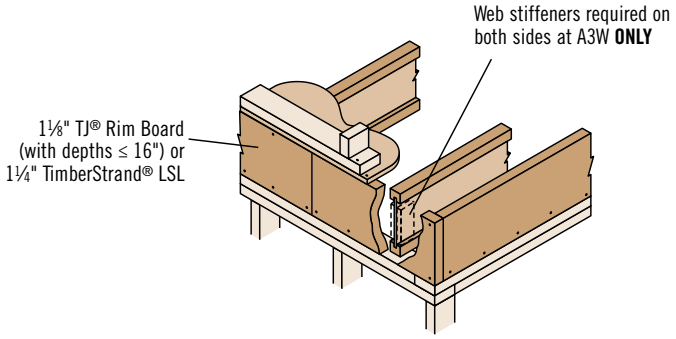
Side walls act as shear force collectors. Loads may accumulate from top of house to bottom.

How do lateral capacities of 1¼" TimberStrand® LSL rim board compare to sawn lumber framing?

In floor or roof diaphragms, 1¼" TimberStrand® LSL rim board is capable of transferring the same lateral loads allowed by code for 2" nominal framing members. This equivalency was verified by testing: CSA O86, Table 9.5.2, Case 1, unblocked diaphragm at 445 plf (specified shear strength) with $^{23}/_{32}$" sheathing and 8d (0.131" x 2½") nails at 6" on-centre.

RIM BOARD INSTALLATION DETAIL





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NAILING ON NARROW FACE

Nails Installed on the Narrow Face

Rim Material	Closest On-Centre Spacing Per Row[1]			
	Nail Size			
	8d (0.113" x 2½"), 8d (0.131" x 2½"), 10d (0.128" x 3"), 12d (0.128" x 3¼")	10d (0.148" x 3"), 12d (0.148" x 3¼")	16d (0.135" x 3½"), 16d (0.148" x 3¼")	16d (0.162" x 3½")
1⅛" TJ® Rim Board	6"	6"	16"[2]	16"[2]
1¼" 1.3E TimberStrand® LSL	4"	4"	4"	6"[3]
1½" 1.3E TimberStrand® LSL and 1¾" 1.55E TimberStrand® LSL	3"	4"	4"	6"[3]
3½" 1.55E TimberStrand® LSL	3"	3"	3"	3½"

(1) If more than one row of nails is used, the rows must be offset at least ½" and staggered.

(2) Can be reduced to 5" on-centre with maximum nail penetration of 1⅜" into the narrow edge (for example, nails that connect the sole plate above to the block or rim).

(3) Can be reduced to 4" on-centre with maximum nail penetration of 1⅜" into the narrow edge (for example, nails that connect the sole plate above to the block or rim).

DESIGN PROPERTIES

Specified Strengths[1] and Moduli of Elasticity (Standard Term)

Rim Material	G Shear Modulus of Elasticity (psi)	E Modulus of Elasticity (psi)	F_b Flexural Stress (psi)	$F_{c\perp}$ Compression Perpendicular to Grain[5] (psi)	$F_{c\parallel}$ Compression Parallel to Grain (psi)	F_v Horizontal Shear Parallel to Grain (psi)	SG Equivalent Specific Gravity[6] (psi)	
							Face Grain	Edge Grain
1⅛" TJ® Rim Board[2]	–	1.0×10^6	2,094	1,195	–	635	0.38[7]	–
1.3E TimberStrand® LSL[3]	81,250	1.3×10^6	3,140[4]	1,240	2,235	745	0.50	0.50
1.55E TimberStrand® LSL	96,875	1.55×10^6	4,295[4]	1,455	3,270	575	0.50	0.50

(1) To obtain factored resistances, apply the appropriate formulae from CSA O86 to the specified strength shown.

(2) 1⅛" TJ® Rim Board is recognized as an acceptable rim board material for use in conventional construction, and can span 8' maximum. TJ® Rim Board distributed in Canada is manufactured only at the TimberStrand® LSL plant 0572 in Kenora, Ontario.

(3) 1¼" TimberStrand® LSL rim board is recognized by code as providing the lateral transfer capacity equivalent to 2" nominal Douglas fir-larch in horizontal diaphragms.

(4) For 12" depth. For other depths of TimberStrand® LSL, multiply F_b by $\left[\frac{12}{d}\right]^{0.092}$

(5) $F_{c\perp}$ must not be increased for duration of load.

(6) For lateral connection design only.

(7) Specific gravity of 0.50 may be used for nails, screws and bolts installed perpendicular to face and loaded perpendicular to grain.

For applications not covered in this brochure, use Forte® software or contact your Weyerhaeuser representative.

ALLOWABLE VERTICAL LOADS

Vertical Load Transfer at Bearing[1]

Rim Material	Factored Vertical Load Resistances (PLF)								Concentrated Load (lb)
	Depth								
	9½"	11⅞"	14"	16"	18"	20"	22"	24"	All Depths
1⅛" TJ® Rim Board	7,045[2]		6,625	5,800	NA[3]				4,930
1¼" 1.3E TimberStrand® LSL	7,830[2]			7,250	6,290	5,365	4,580	3,930	5,450
1½" 1.3E TimberStrand® LSL	9,395				9,250	8,325	7,350	6,440	6,555
1¾" and 3½" 1.55E TimberStrand® LSL	10,960[2]								10,830

(1) Values may not be increased for duration of load.

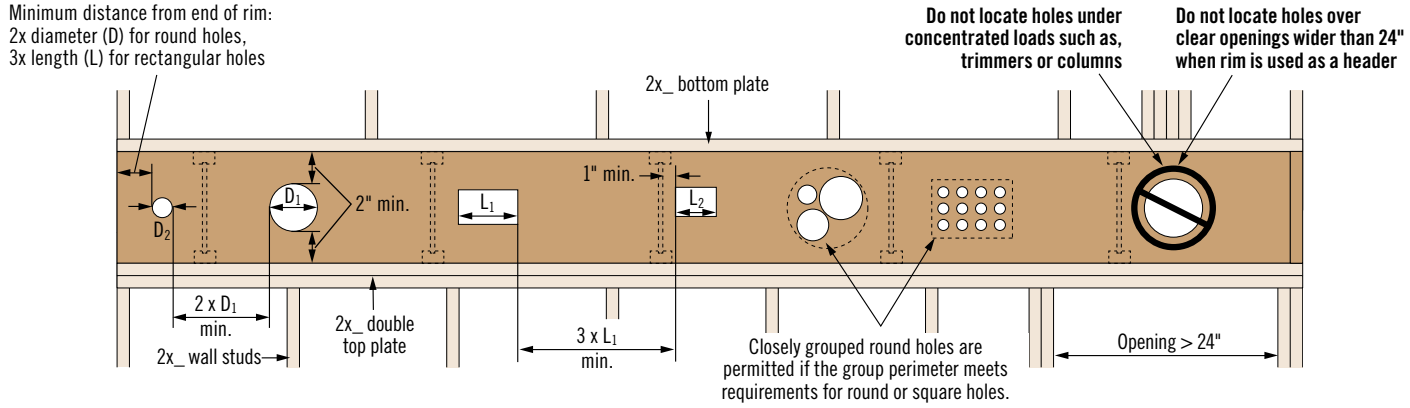
(2) Capacity is limited to a maximum of 522 psi in accordance with ASTM D7672.

(3) 1⅛" TJ® Rim Board is limited to a depth of 16" or less.

General Notes

- 1¾" and 3½" TimberStrand® LSL is beam material and may be used as rim board.

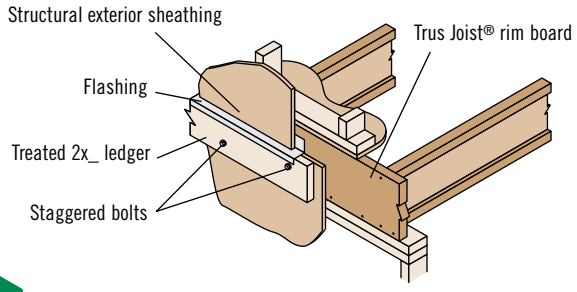
ALLOWABLE HOLES



General Notes

- Hole depth must not exceed rim depth minus 4". Rectangular hole length must not exceed ⅔ of the joist spacing.
- The horizontal distance between the edges of adjacent round holes must be at least twice the diameter of the largest adjacent round hole, and three times the length of the largest adjacent rectangular hole.
- The horizontal distance between the end of the rim and the edge of the hole must be at least twice the diameter for a round hole and three times the hole length for a rectangular hole.
- Do not over cut rectangular holes.
- Maintain at least 2" from the top and bottom edge of the rim and at least 1" from the edge of a floor joist.
- Do not locate holes under concentrated loads or where rim is used as a header that clear spans more than 24".

EXTERIOR DECK ATTACHMENT



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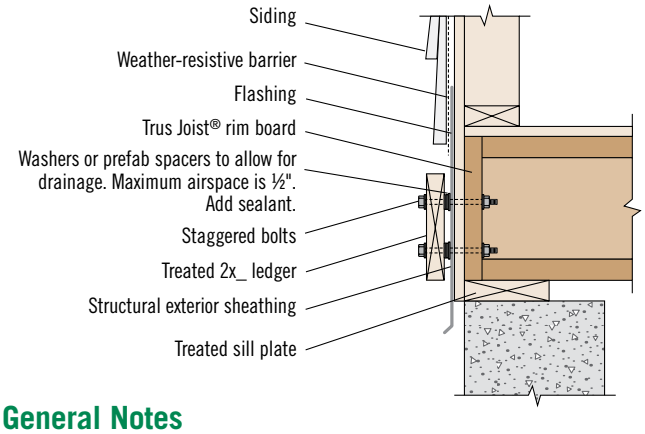
Shimmed Deck Attachment



Ledger Fastener(1) Factored Resistances

Rim Material	Fastener Factored Resistances(2) (lbs/bolt)		
	½" Lag Bolt	½" Through Bolt	½" Through Bolt with Air Space
1⅛" TJ® Rim Board	695	1,005	890(3)
1¼" 1.3E TimberStrand® LSL	885	1,050	
1½" 1.3E TimberStrand® LSL	980	1,050	
1¾" and 3½" 1.55E TimberStrand® LSL	1,050		

(1) Corrosion-resistant fasteners required for wet-service applications.
(2) Factored resistance determined in accordance with ASTM D7672.
(3) Maximum ½" shimmed airspace.

General Notes

- Maintain 2" distance (minimum) from edge of ledger to fastener. Stagger bolts.
- Local building codes may require through bolts with washers.
- Lateral restraining connections may be required.

Trus Joist® rim board products are intended for dry-use applications

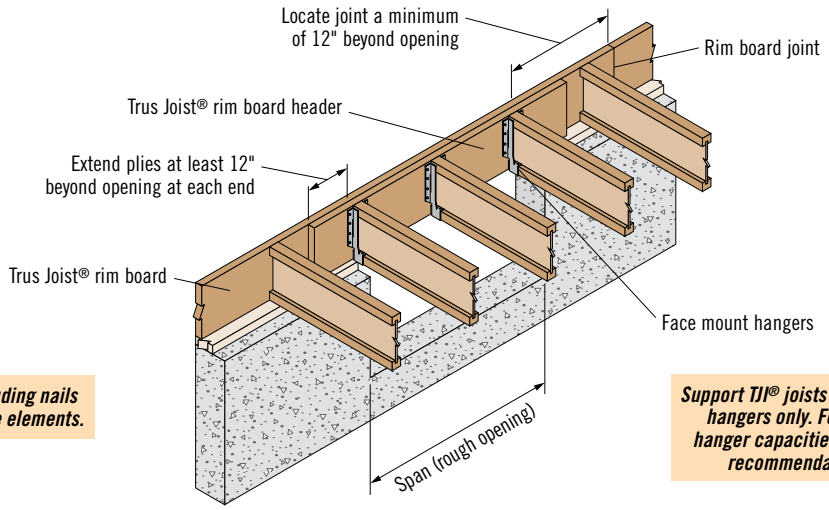
MULTIPLE-MEMBER CONNECTIONS FOR 2-PLY RIM BOARD

Fastener Installation Requirements(1)

Loading Condition	Ply Width	Fastener Requirements				Maximum Factored Uniform Load Applied to Either Outside Member (plf)
		Nail Type(2)	# Rows	On-Centre Spacing	Location	
Top	1¼", 1½"	8d or 10d	3(3)	12"	One side	–
	1¾"	10d	3(3)			–
Side	1¼" and 1½"	8d	2			455
			3			685
	1¼", 1½", 1¾"	10d	2			575
			3			865

(1) For connection of two 3½"-wide plies, see the *Trus Joist® Beam, Header and Column Specifier's Guide*, TJ-9500 for Eastern Canada or TJ-9505 for Western Canada.
(2) 8d nails are 0.113" diameter by 2½" long; 10d nails are 0.128" diameter by 3" long.
(3) An additional row of nails is required with depths of 14" or greater.

HEADER APPLICATION



Ensure that clinched or protruding nails do not affect building envelope elements.

Support TJI® joists from rim board header with face mount hangers only. For 1-ply header applications, reduce hanger capacities according to hanger manufacturer's recommendations. Clinch nails when possible.

RIM BOARD Q&A

Q1: Why is TimberStrand® LSL Rim Board 1¼" thick?

A1: The 1¼" thickness of TimberStrand LSL rim board provides several benefits.

Reduced splitting. Nailing at the top of rim board typically includes floor sheathing nails and wall plate nails which can result in significant congestion and splitting. Through field experience and testing, Weyerhaeuser has found that 1¼" thick rim board provides enough nailing surface to reduce splitting risk and maximize vertical and lateral load transfer.

Versatility. Unlike commodity rim board products, 1¼" TimberStrand® LSL can be used to span over wall openings, similar to Trus Joist® beam products. Use Forte sizing software to determine maximum spans.

Increased capacity. In addition to having higher vertical load and ledger fastener capacities than thinner commodity rim board products, 1¼" TimberStrand® LSL allows designers to develop larger lateral load capacity with additional hardware such as framing anchors.

Q2: What are the advantages of 1⅛" TJ® Rim Board?

A2: 1⅛" TJ® Rim Board is an ideal alternative to I-joists as closure material because it provides higher vertical load capacities and is simpler to install. It also meets the requirements for residential applications that fall within Part 9 of the *National Building Code of Canada* and some multi-family (Part 4) projects.

Q3: Are all 1⅛" rim board products equal?

A3: No. 1⅛" TJ® Rim Board distributed in Canada is unique because it's manufactured using the same technology as TimberStrand® LSL in Kenora, Ontario (TimberStrand® LSL plant 0572). As a result, TJ® Rim Board from this plant is available in longer lengths of 12' to 16'. And in comparison to commodity 1⅛" rim board products, it has higher stiffness properties and can span up to 8'.

Q4: When should TimberStrand® LSL rim board be specified instead of TJ® Rim Board?

A4: TimberStrand® LSL rim board is a better product from an installation, application and capacity standpoint. Suitable for both single-family and multi-family projects, it is ideal for engineered applications or situations requiring higher load resistance. TimberStrand LSL rim board is also the only product available for use with joist depths greater than 16".

TJ® Rim Board is an excellent alternative for light duty applications such as typical residential construction where joists depths do not exceed 16".

Q5: What is the lateral capacity of TimberStrand® LSL rim board and TJ® Rim Board?

A5: In general, when installed according to with Trus Joist® installation guides, the lateral capacity of TJ® Rim Board can meet the lateral demand of prescriptive Part 9 applications. The lateral capacity of 1¼" TimberStrand® LSL rim board is dependent on the connection schedule. Connections should be designed in accordance with CSA 086. Refer to the Design Properties table on page 4, for more information.

Q6: When TJI® joists are cantilevered and a deck is attached to the rim board closure, do rim board-to-joist connections require any special considerations?

A6: This is a very specialized connection that must be designed by the designer of record. End nails installed into the top and bottom flange as shown in standard Trus Joist® rim board connection details will not provide sufficient support for the additional loading from a deck. One possible solution is to invert the hangers which will transfer forces from the loaded rim board to the end of a cantilevered TJI® floor joist.

Q7: At exterior wall locations, the rim board is placed toward the exterior face of the wall, rather than centered under the wall plate. Does this affect the rim board capacity?

A7: No capacity adjustment is necessary. The vertical capacities in this guide account for this configuration, and are based on years of successful product application and testing. Therefore, with uniform loads, no additional blocking or squash blocks are necessary. However, it is always important to verify that vertical load capacity of rim board is not exceeded. Trus Joist® rim board products are manufactured to exact tolerances, and of slightly greater depth than TJI® floor joists to prevent the joists from being loaded by the wall above.

For rim board located on exterior walls and parallel to the floor joists, most residential applications do not require additional blocking. However, check the plans for blocking or additional hardware that the building designer may have specified to address other issues, such as wall rotation under wind loading or foundation movement from soil pressure.

Q8: Can TimberStrand® LSL or TJ® Rim Board be used with insulated concrete form (ICF) systems?

A8: Yes. Special consideration is required to ensure a direct vertical load path from the rim board to the sill plate and into the foundation. This is commonly achieved by using tapered insulation.

Q9: Can TimberStrand® LSL or TJ® Rim Board be used as spanning members?

A9: Yes. Both products can be used as spanning members. TJ® Rim Board is limited to a maximum span of 8'. While, TimberStrand® LSL does not have a maximum span limitation as long as the member is properly designed.

Q10: Is TimberStrand® LSL or TJ® Rim Board available for design in Trus Joist software?

A10: Yes. Forte® software can size 1¼" TimberStrand® LSL rim board as a beam product, and both products are available in Javelin® software as rim board members.

Q11: Can TimberStrand® LSL or TJ® Rim Board be used in one-hour fire separation wall assemblies?

A11: Yes. Refer to the *Weyerhaeuser Fire-Rated Assemblies and Sprinkler Systems Design and Installation Guide*, 1500 for additional information.

NOTES

WE CAN HELP YOU BUILD SMARTER

You want to build solid and durable structures—we want to help. Weyerhaeuser provides high-quality building products and unparalleled technical and field assistance to support you and your project from start to finish.

Floors and Roofs: Start with the best framing components in the industry: our Trus Joist® TJI® joists; TimberStrand® LSL rim board; and TimberStrand® LSL, Microllam® LVL, and Parallam® PSL headers and beams. Pull them all together with our self-gapping and self-draining Weyerhaeuser Edge Gold™ floor panels and durable Weyerhaeuser roof sheathing.

Walls: Get the best value out of your framing package—use TimberStrand® LSL studs for tall walls, kitchens, and bathrooms, and our traditional, solid-sawn lumber everywhere else. Cut down installation time by using TimberStrand® LSL headers for doors and windows, and Weyerhaeuser wall sheathing with its handy two-way nail lines.

Software Solutions: Whether you are a design professional or lumber dealer, Weyerhaeuser offers an array of software packages to help you specify individual framing members, create cut lists, manage inventories—even help you design a complete structural frame. Contact your Weyerhaeuser representative to find out how to get the software you need.

Technical Support: Need technical help? Weyerhaeuser has one of the largest networks of engineers and sales representatives in the business. Call us for help, and a skilled member from our team of experts will answer your questions and work with you to develop solutions that meet all your structural framing needs.

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